426/19
5
U.S.Patent # 579,739
1896
99/90
RECORDED

N° 17,590 A.D. 1895

Trade-mark "Zymax"

Date of Application, 20th Sept., 1895

Complete Specification Left, 24th Feb., 1896—Accepted, 4th July, 1896

DUPLICATE.

PROVISIONAL SPECIFICATION.

Improvements in the Manufacture of Bread, Cakes, and other similar Food.

We, GEORGE ARCHIBALD CLOWES, of Needham Market, in the County of Suffolk, Maltster, MAURICE PAUL HATSCHEK, of 51 Fulham Park Gardens, in the County of Middlesex, Chemical Engineer, and LAWRENCE BRIANT, of 24 Holborn Viaduct, in the County of London, Analytical Chemist, do hereby declare the nature of this invention to be as follows :—

Heretofore a certain proportion of flour prepared from ordinary brewers' malt has been combined with ordinary flour in the manufacture of bread ; malt extract of high diastasic value has also been combined with ordinary flour in the manufacture of bread, but in either case the malt flour or the malt extract did not possess in addition to the ordinary diastase certain enzymes which are lost in the method of preparing ordinary brewers' malt or malt extract but which should exist in the malt we use. The use of malt flour prepared from ordinary brewers' malt has not however been attended with success, in fact malt extract has been found to give better results.

We have discovered that by using a malt flour made from a specially prepared malt giving 70 degrees or more of diastasic value as determined by Lintner's process, and containing also appreciable amounts of the cellulose dissolving enzyme —cytase,—such malt flour when added to ordinary flour in the manufacture of bread or other like food, produces an improved quality of bread or other food superior to that obtained either by the use of ordinary malt flour or by the use of malt extract.

We are aware that malt of the character proposed to be used by us in the manufacture of diastasic malt flour has hitherto been prepared for the use of brewers and distillers, but such has not to our knowledge been heretofore used in the form of flour in the manufacture of bread and the like.

The special malt we employ is prepared in a known manner, namely by steeping suitable barley, by preference Smyrna or South European growths, for 50 to 60 hours, and afterwards submitting it to rapid germination. This rapid germination is encouraged by copious supplies of water sprinkled on the germinating barley, thus encouraging the development of the before mentioned enzymes, which we are careful to retain in the process of drying on the kiln by submitting the malt to a slowly progressive heat which at the end of a lengthened period of four to five days does not exceed 120 degrees Fahrenheit.

The malt thus prepared is reduced to flour by grinding in a suitable mill and the bran removed by sifting out to the extent of about one fifth of the original weight of the malt.

In the manufacture of our improved bread or other like food the malt flour as above prepared is added to the ferment prepared by some bakers at the time that such is set to work, but when this process is not resorted to the malt flour should be carefully mixed with the sponging or doughing liquor or water at least one hour before it is used, during which time the mixture should be stirred occasionally. The quantity of malt flour to be used is 1 pound to 280 pounds of millers' flour, but this proportion may be varied according to the requirements of the baker or the quality of flour used. The heat of the ferment or of the sponging

[*Price* 8*d*.]

26

or doughing liquor or water should never exceed 100 degrees Fahrenheit in order to ensure the beneficial action of the enzymes above referred to.

Dated this 20th day of September 1895.

HARRIS & MILLS,
23 Southampton Buildings, London, W.C., Agents.

COMPLETE SPECIFICATION.

Improvements in the Manufacture of Bread, Cakes, and other similar Food.

We, GEORGE ARCHIBALD CLOWES, of Needham Market, in the County of Suffolk, Maltster, MAURICE PAUL HATSCHEK, of 51, Fulham Park Gardens, in the County of Middlesex, Chemical Engineer, and LAWRENCE BRIANT, of 24 Holborn Viaduct, in the County of London, Analytical Chemist, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

Heretofore a certain proportion of flour prepared from ordinary brewers' malt has been combined with ordinary flour in the manufacture of bread, with a view to imparting a pleasant and distinct malt flavour to the bread to which such malt flour has been added, thus enabling it to be termed "malt bread." Malt capable of imparting this distinctive malt flavour differs, as will be hereinafter shown, materially from our malt flour, which imparts no distinctive malt flavour, which malt flavour can only be satisfactorily imported into bread designated "malt bread," but would not be applicable or desirable in ordinary bakers' household bread. Malt extract of high diastasic value has also been combined with ordinary flour in the manufacture of bread, but in either case the malt flour or malt extract did not possess, in addition to the ordinary diastase, certain enzymes, which are lost in the method of preparing ordinary brewers' malt or malt extract, but which do exist in the malt or malt flour which we use. The use of malt flour prepared from ordinary brewers' malt has not however been attended with very marked success; some malt extracts, however, have been found to give good results but, unlike our diastasic malt flour, cannot be added to ordinary flour in its dry condition.

We have discovered that by using a malt flour made from a specially prepared malt giving 70 degrees or more of diastasic value as determined by Lintner's process, and containing peptase, as also appreciable amounts of the cellulose dissolving enzyme—cytase,—which enzyme has been, so far as we are aware, non-existent in malt flour used for baking purposes, such malt flour, when added to ordinary flour in the manufacture of bread or other like food, produces an improved quality of bread or other food superior to that obtained either by the use of ordinary malt flour or by the use of malt extract.

We have also discovered that malt flour made from the said specially prepared malt, containing as it does soluble albuminous matter in the form of diastase, peptase, cytase, &c., acts as a food to the yeast employed in bread making, stimulating it much more than malt extract and thus hastening the process of fermentation in a proportionate degree.

We are aware that malt of the character proposed to be used by us in the manufacture of diastasic malt flour has hitherto been prepared for the use of distillers, but such has not to our knowledge been heretofore used in the form of flour in the manufacture of bread and the like.

The special malt we employ is epprared in a known manner, namely, by using suitable English or foreign barley, wheat, rye, oats, maize, or other cereals

or seeds containing and capable of developing diastase, cytase, &c., which grain or seed is steeped for from 50 to 70 hours and afterwards submitted to rapid germination. This rapid germination is encouraged by copious supplies of water sprinkled on the germinating barley, wheat, rye, oats, maize, or other cereals or seeds, thus encouraging the development of the before mentioned enzymes, which are carefully retained in the process of drying on the kiln by submitting the malt to a slowly progressive heat, which at the end of the drying period does not exceed 120 degrees Fahrenheit. Malt dried at temperatures below the above heat has practically no flavour of malt, and consequently could not be used to impart a malt flavour to bread. To acquire such a malt flavour, the malt would have to be submitted to a temperature of not less than 160° Fahrenheit, at which temperature cytase would long before have entirely disappeared, whilst diastase would be distinctly crippled in its power to convert starch into maltose. The malt we propose to use has no flavour of malt in itself, but has the power by the presence of the before mentioned enzymes—diastase, cytase, &c.—to produce a marked sweetness and moisture in bread.

The malt prepared as above stated is reduced to flour by grinding in a suitable mill and the bran removed by sifting out to the extent of about one fifth or more of the original weight of the malt. By the use of this flour we are able to replace in soluble, and therefore a suitable and actually more digestible form, the albuminous matters which roller milling now separates, and this without any sacrifice in the whiteness of the bread.

In the manufacture of our improved bread or other like food, the malt flour as above prepared may be added to the "ferment"—prepared by some bakers—at the time that such is set to work. When this process is not resorted to, the malt flour may be carefully mixed with the sponging or doughing liquor or water, wherein it should be occasionally stirred; or it may be added by the miller or baker either in the course of milling operations or when blending the various flours required by the baker. The quantity of malt flour to be used is 1 lb. to the sack (280 lbs.) of miller's flour, but this proportion may be varied according to the requirements of the baker or the quality of flour used. The heat of the ferment or of the sponging or doughing liquor or water should never exceed 100 degrees Fahrenheit in order to ensure the beneficial action of the enzymes above referred to.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

The introduction into flour, or dough made from flour, of enzymes by mixing with the flour or dough a proportion of malt (specially prepared as hereinbefore described) in the manner and for the purposes mentioned.

Dated this 24th day of February 1896.

HARRIS & MILLS,
23 Southampton Buildings, London, W.C., Agents.

London: Printed for Her Majesty's Stationery Office, by Darling & Son, Ltd.—1896